AMENDMENTS TO THE CLAIMS

1. **(Currently Amended)** An isolated mutated GDF-9 nucleic acid molecule comprising a nucleotide sequence selected from the group consisting of

a) ~~SEQ ID NOs.~~ SEQ ID NOS:1, 3 or 5;

b) a sequence complementary to the molecule defined in a);

c) a functional fragment or variant of the sequences in a) or b); and

d) an anti-sense sequence to any of the molecules defined in a), b) or c).

2. **(Currently Amended)** An isolated mutated GDF-9B nucleic acid molecule comprising a nucleotide sequence selected from the group consisting of:

a) ~~SEQ ID NOs.~~ SEQ ID NOS: 7, 9, 11, 13, 15 or 17;

b) a sequence complementary to the molecule defined in a); and

c) an anti-sense sequence to any of the molecules defined in a) or b).

3. **(Original)** An isolated GDF-9 nucleic acid molecule comprising a mutation in at least one codon of the sequence associated with receptor binding and/or dimerisation.

4. **(Original)** An isolated GDF-9 nucleic acid molecule as claimed in claim 3, wherein said mutation results in an amino acid substitution in the polypeptide encoded by said nucleic acid sequence.

5. **(Original)** An isolated GDF-9 nucleic acid molecule as claimed in claim 4, wherein said amino acid substitution is present in a receptor binding domain and disrupts receptor binding.

6. **(Original)** An isolated GDF-9 nucleic acid molecule as claimed in claim 4, wherein said amino acid substitution is present in a dimerisation domain and disrupts dimerisation.

7. **(Original)** An isolated GDF-9B nucleic acid molecule comprising a mutation in at least one codon sequence associated with receptor binding and/or dimerisation.

8. **(Original)** An isolated GDF-9B nucleic acid molecule as claimed in claim 7, wherein said mutation results in an amino acid substitution in the polypeptide encoded by said nucleic acid sequence.

9. **(Original)** An isolated GDF-9B nucleic acid molecule as claimed in claim 8, wherein said amino acid substitution is present in a receptor binding domain and disrupts receptor binding.

10. **(Original)** An isolated GDF-9B nucleic acid molecule as claimed in claim 8, wherein said amino acid substitution is present in a dimerisation domain and disrupts dimerisation.

11. **(Currently Amended)** A method of identifying a mammal which carries a mutated nucleic acid molecule encoding GDF-9B, said method comprising the steps of

i) obtaining a tissue or blood sample from the mammal;

ii) isolating DNA from the sample; and ~~optionally~~

~~iii) isolating GDF-9B DNA from the DNA obtained at step i) or ii);~~

~~iv)~~ iii) probing said DNA with a probe complementary to either strand of the mutated GDF-9B DNA of SEQ ID NOs 11 or 17;

~~v)~~ iv) amplifying the amount of mutated GDF-9B DNA;

~~vi)~~ v) determining whether the GDF-9B sequence DNA obtained in step iv) ~~v)~~ carries a mutation associated with sterility or increased ovulation.

12. **(Currently Amended)** A method of identifying a mammal which carries a mutated nucleic acid molecule encoding GDF-9, said method comprising the steps of:

i) obtaining a tissue or blood sample from the mammal;

ii) isolating DNA from the sample; and ~~optionally~~

~~iii) isolating GDF-9 DNA from the DNA obtained at step i) or ii);~~

~~iv)~~ iii) probing said DNA with a probe complementary to either strand of the mutated GDF-9 DNA of SEQ ED NO 5;

~~v)~~ iv) amplifying the amount of mutated GDF-9 DNA;

~~vi)~~ v) determining whether the GDF-9 sequence DNA obtained in step iv) ~~v)~~ carries a mutation associated with sterility or increased ovulation.

13. **(Currently Amended)** A method of identifying a mammal carrying a mutated nucleic acid molecule encoding GDF-9B, comprising: ~~use of~~

obtaining a tissue or blood sample from the mammal;

isolating nucleic acid from said sample;

contacting said nucleic acid sample with a marker comprising a nucleic acid molecule ~~which is~~ complementary to either strand of ~~the mutated DNA of~~ SEQ ID ~~NOs.~~ NOs: 11 or 17 ~~as a marker~~; and

identifying whether said marker bound to said nucleic acid sample to identify a mammal carrying a mutated nucleic acid molecule encoding GDF-9B.

14. **(Currently Amended)** ~~A use of a marker as defined in~~ The method of claim 13 ~~in a method for marker assisted selection of a~~ wherein said mammal ~~which~~ possesses a genotype which is associated with either enhanced ovulation or sterility.

15. **(Currently Amended)** ~~A use of a nucleic acid molecule which is complementary to either strand of the mutated DNA of~~ The method of claim 13, wherein said marker nucleic acid is SEQ ID NO: 5 ~~as a marker to identify a mammal carrying a mutated nucleic acid molecule encoding GDF-9~~.

16. **(Cancelled)**

17. **(Currently Amended)** A probe capable of specifically hybridising to either strand of the mutated GDF-9B DNA of SEQ ID ~~NOs~~ NOs: 11or 17 under stringent hybridisation conditions.

18. **(Currently Amended)** A probe capable of hybridising to either strand of the mutated GDF-9 DNA of SEQ ID ~~NO~~ NO: 5 under stringent hybridisation conditions.

19. **(Currently Amended)** A construct comprising a nucleic acid molecule as claimed in claim 1 ~~or 2~~.

20. **(Currently Amended)** A vector comprising a nucleic acid molecule as claimed in claim 1 ~~or 2~~.

21. **(Currently Amended)** A host cell which comprises a construct or vector as claimed in claim 19 ~~or 20~~ which has been introduced therein.

22. **(Original)** A cell line comprising a host cell as claimed in claim 21.

23. **(Currently Amended)** A method of altering GDF-9 and/or GDF-9B bioactivity in a female mammal so as to modulate ovulation comprising the ~~steps~~ step of either:

(a) inducing a partial immunisation response to endogenous GDF-9 and/or GDF9B to partially reduce bioactivity thereof and enhance ovulation; or

(b) inducing a full immunisation response to endogenous GDF-9 and/or GDF-9B to substantially reduce bioactivity thereof and induce sterility.

24. **(Currently Amended)** A method as claimed in claim 23, wherein said immunisation response is induced by administration of an antigenic composition comprising:

i) a GDF-9 polypeptide or a functional fragment or variant of GDF9; and/or

ii) a GDF-9B polypeptide or a functional fragment or variant of GDF-9B;

together with a pharmaceutically or veterinarily acceptable carrier and/or diluent;

to a mammal in need thereof [[.]]

25. **(Original)** A method as claimed in claim 24, wherein said antigenic composition comprises a mild adjuvant to induce a partial immunisation response and induce enhanced ovulation.

26. **(Original)** A method as claimed in claim 24, wherein said antigenic composition comprises a strong adjuvant to induce a full immunization response and induce sterility.

27. **(Currently Amended)** A method as claimed in claim 23 ~~any one of claims 23 to 26~~, wherein said partial immunization response is induced by a short term immunization regime.

28. **(Currently Amended)** A method as claimed in claim 23 ~~any one of claims 23 to 26~~, wherein said fall immunization response is induced by a long term immunization regime.

29. **(Original)** A method as claimed in claim 24, wherein said immunization response is induced passively by administration of antibodies raised against said antigenic composition.

30. **(Currently Amended)** A method as claimed in claim 29, wherein said antibodies are administered according to a short term ~~tern~~ regime to induce a partial immunization response and induce enhanced ovulation.

31. **(Original)** A method as claimed in claim 29, wherein said antibodies are administered according to a long term regime to induce a full immunization response and induce sterility.

32. **(Currently Amended)** A method as claimed in claim 23 ~~any one of claims 23, 24, 26, 28, 29, and 31~~, wherein said fall immunization response is temporary and/or reversible and wherein said sterility induced comprises contraception.

33. **(Currently Amended)** A method as claimed in claim 23 ~~any one of claims 23, 24, 26, 28, 29, and 31~~, wherein said full immunization response and said sterility induced is permanent.

34. **(Original)** A method for breeding a mammal having increased ovulation comprising the steps of.

a) identifying the nucleotide sequences of GDF-9 or GDF-9B carried by the female mammal it is proposed to breed from;

b) identifying the nucleotide sequences of GDF-9 or GDF-9B carried by the male mammal it is proposed to breed from;

c) selecting the female and male animals that will result in progeny having the following characteristics:

i) a single copy of a mutated GDF-9 nucleotide sequence comprising:

A) SEQ ID NO 5; or

B) a functional variant or fragment of the molecule in A); or

C) a sequence complementary to the molecule in A) or B); and/or

ii) a single copy of mutated GDF-9B nucleotide sequence comprising:

A) SEQ ID NOs 11 or 17; or

B) a sequence complementary to the molecule(s) in A).

35. **(Original)** A method as claimed in claim 34, wherein said mammal is selected to have a single mutated copy of GDF-9 and GDF-9B.

36. **(Original)** A method for selecting a female mammal for breeding which possesses a genotype indicative of an increased rate of ovulation, said genotype comprising a single mutated copy of:

1) a mutated GDF-9 nucleotide sequence comprising:

a) SEQ ID NO 5; or

b) a functional variant of the molecule of a); or

c) a sequence complementary to the molecules in a) or b); and/or

2) a mutated GDF-9B nucleotide sequence comprising:

a) SEQ ID NOs 11 or 17; or

b) a sequence complementary to the molecules in a);

said method comprising identifying said mammal according to the method of claim 11 and/or 12 and selecting said mammal.

37. **(Original)** A method as claimed in claim 36 wherein the mammal selected has both a single mutated copy of GDF-9 and GDF-9B.

38. **(Original)** A method of modifying the function of the corpus luteum by administering supplementary GDF-9 or GDF-9B or analogues thereof, or GDF-9 or GDF9-B antagonists to female mammals.

39. **(Currently Amended)** A transgenic non-human animal ~~wherein~~ comprising a knock out of at least one copy of the endogenous GDF-9 and/or GDF-9B gene ~~has been knocked out~~.

40. **(Original)** A transgenic non-human animal as claimed in claim 39, comprising a transgenic ovine having a genome lacking one copy of a gene encoding a protein having biological activity of GDF-9 and/or GDF-9B.

41. **(Currently Amended)** An isolated mutated GDF-9 polypeptide comprising an amino acid sequence selected from the group consisting of SEQ ID NOs: 2, 3, ~~or~~ 6 ~~or~~ and a functional fragment or variant thereof.

42. **(Currently Amended)** An isolated mutated GDF-9B polypeptide comprising an amino acid sequence selected from the group consisting of SEQ ID NOs: 8, 10, 12, 14, 16, ~~or~~ and 18.

43. **(Currently Amended)** A composition comprising an isolated nucleic acid as claimed in claim 1 ~~any one of claims 1 to 10~~, or an isolated polypeptide as claimed in claim 41 ~~or 42~~ and a pharmaceutically acceptable carrier.

44. **(NEW)** The method of claim 11, further comprising: isolating GDF-9B DNA from the DNA obtained at step i) or ii).

45. **(NEW)** The method of claim 12, further comprising isolating GDF-9 DNA from the DNA obtained at step i) or ii).